

I claim:

1. A method of formatting data, comprising:
determining a total number of programming states values for storing input data in an array of multistate memory cells;
converting the input data to an encoded data based on the total number of programming states such that a total number of programming states for storing the encoded data is less than the total number of programming states for storing the input data; and
arranging the encoded data and a decoding scheme in a data packet, wherein the decoding scheme converts the encoded data back to the input data.
2. The method according to claim 1, wherein the decoding scheme is the inverse of an encoding scheme used to convert the input data to encoded data.
3. The method according to claim 1, wherein the decoding scheme is the same as an encoding scheme used to convert the input data to encoded data.
4. The method according to claim 1, wherein arranging the encoded data and the decoding scheme includes arranging error correction codes, bad bit address, and replacement bit addresses in the data packet and storing the data packet in the array of multistate memory cells.
5. The method according to claim 1, wherein determining a total number of programming states values includes converting the data contained in the set of data to a format which allows a direct summing of the data to determine the number of programming states.
6. The method according to claim 1, wherein determining a total number of programming states values includes determining an average programming state per memory cell for the data contained in the set of data.

7. The method according to claim 1, wherein determining a total number of programming states values includes: counting a number of times each programming state of the multistate memory cells is traversed in programming the memory cells with the set of data when using an encoding scheme; and assigning the programming states of the memory cells in order from the lowest to highest programming state to the programming states which were traversed in order the highest to lowest number of times in programming the memory cells using the encoding scheme.

8. A method of formatting data, comprising:
determining a total number of programming states values for storing input data in a memory array;

converting the input data to an encoded data based on the total number of programming states such that a total number of programming states for storing the encoded data is less than the total number of programming states for storing the input data;

arranging the encoded data and a decoding scheme in a data packet, wherein the decoding scheme converts the encoded data back to the input data; and

storing the data packet in a memory.

9. The method according to claim 8, storing includes storing an inversion of the encoding scheme as the decoding scheme.

10. The method according to claim 8, wherein storing the data packet includes storing the encoding scheme as the decoding scheme.

11. The method according to claim 8, wherein determining a total number of programming states values includes adding the data values for the data contained in the set of data.

12. The method according to claim 8, wherein determining a total number of programming states values includes converting the data contained in the set of data to a

format which allows a direct summing of the data to determine the number of programming states.

13. The method according to claim 8, wherein determining a total number of programming states values includes determining an average programming state per memory cell for the data contained in the set of data.

14. The method according to claim 8, wherein determining a total number of programming states values includes: counting a number of times each programming state of the memory cells is traversed in programming the memory cells with the set of data when using an encoding scheme.

15. The method of claim 8, wherein determining a total number of programming states values includes identifying at least three progressive programming levels in the memory array.

16. A method of formatting data, comprising:

determining a total number of programming states values for storing input data in a memory array;

converting the input data to an encoded data based on the total number of programming states such that a total number of programming states for storing the encoded data is less than the total number of programming states for storing the input data;

arranging the encoded data and a decoding scheme in a data packet, wherein the decoding scheme converts the encoded data back to the input data, wherein arranging the encoded data and the decoding scheme includes arranging error correction codes, bad bit address, and replacement bit addresses in the data packet; and

storing the data packet in the memory array.

17. The method of claim 16, wherein determining a total number of programming states values includes identifying at least three progressive programming levels in the memory array.

18. The method of claim 16, wherein determining a total number of programming states values includes determining the number of states of a flash memory.

19. The method of claim 16, wherein determining a total number of programming states values includes determining the number of states of an EEPROM.